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*A Discourse concerning Digestion in a Letter to the Publisher from Mr. Charles Leigh of Brasen-Nose Colledge Oxford.*

*S I R,*

Should I reckon up here the many controverted *hypotheses* of *Anatomists* concerning this *subject*, & let up a new one of my own; it might perhaps seem a piece of fond presumption: I shall not therefore be so vainly *opinionative* as to think that I have here fully explained the nature of *Chylification*, but shall onely give you an account of an *Artificiall* digester which I hope may something illustrate the *naturall* one. It has been observ'd by *Hel'mont*, *Meibius*, *Tachenius*, and the Honourable Mr. *Boyle*, that meats by being kept in an *acid* liquor, would looke extreamly *white*. But I doe not find that by the help of a *salt* that is meerly an *acid*, there can be any *chyle* prepared from any *meats*. *Wedelius* is of opinion that *Chyle* is nothing but a mixture of *oil* and *Serum*. *Tilingius* affirms that tis made by a *nitrous Salt*. Dr. *Harvey* by *trituration*. Dr. *Willis* by an *acid* and *Sulphur*. *Diemerbrook* and *Sylvius* by the *Saliva*. Dr. *Mayow* by a *Nitroaerial principle*. *Galen* and *Aristotle* by *heat*. Others by a ferment spewed from the *glands* in the bottom of the *Stomach*. Others by the *relicts* of the meat grown *sour*. So many different *opinions* I shall neither pretend to reconcile or decide. And shall therefore onely lay down the *Phænomena* which this liquor afforded, and from them draw inferences as probable conjectures. But shall in the first place premise a description of this *digesting liquor*, and see how far it may probably parallel the *naturall ferment* in the *Stomach*. The *taste* of it is like meat vomited out of a full *Stomach*, something *Sour*, but will not ferment with an *Alkali*.

It is prepared from spirit of *Sulphur*, spirit of *Hartshorn*,  
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the *Chyle* of a *Dog* and the *Saliva*: it is pellucid and without any smell: the *Salt* that it shoots into is *cubical*. Upon *veal* it afforded these *Phænomena*. Into a dram of this liquor I put a piece of *veal* about the bigness of a *Nut*, & set it upon a digesting furnace. In two hours time there came from the meat a liquor that had the colour and taste of *Chyle*, and the meat afterwards was lighter, dry, and insipid. And it afforded the same *Phænomena* also in *beef*, *mutton*, or any other meat that I could meet with. And here it is to be noted, that tho' it has been affirm'd by some that the same thing may be done by *acid* liquors only, yet since by all the tryals I have made upon 'em, I have not yet observ'd the like *Phænomena*, I hope my *Scepticism* in this case may be pardonable. If therefore we now consider that by the help of this *menstruum* there came from the before mentioned meats, a liquor which had the colour and taste of *Chyle*, and if we further consider that the taste of this *menstruum* is not distinguishable from the taste which is perceptible in meats vomited out of a full *stomach*; I hope I may without being thought fond of an *Hypothesis*, conjecture that by some such *menstruum* the meat is digested in the *stomach*. But here I would not be thought to affirm that by a liquid *menstruum* alone the meats are digested, but that there are likewise required these further requisits, in some, or in most creatures. First, that the *stomach* receive a gentle heat from the *liver*. 'Tis therefore for this reason said by the Learned *Glisson*, *Calor hepatis in hepate est actio, & ventriculo est usui*.

Secondly, that the *stomach* have a *naturall* situation. For, says *Riolanus*, *Interdum ventriculus propendet usque ad umbilicum, ut observatum in cadaveribus, quod vita coctioni multum immo modat*. And *Vesalius* in his *Anatomy* Lib. 4. gives us this example. *Observavi omentum in scrotum devolutum & auctum ventriculum ex sede sua distractum, adeo ut munus ejus desiceret*. Thirdly, it is assisted by the *omentum*. This may be argued from thole creatures which

have no caul, helping *concoction* by doubling their hinder legs, and resting their bellies upon them, as hares and conies. A second instance may be brought from *Valentinus. Andreas Molenbrochius in Miscellaneis curiosis Ann. 1670. Militaris quidam vir dum viveret nil nisi ventriculum accusabat, quod nullum cibum appeteret coqueretque, cui ad confortandum ventriculum multa adhibita fuere, sed omnia incassum: dissecto cadavere, omentum plane putrefactum est, ventriculo reliquisque visceribus salvis; ex quo colligitur, omentum ad ventriculi coctionem non parum facere.* Fourthly, 'tis necessary that the *stomach* have a *Tunica villosa*: 1. Because that by that it is enabled to divide the meat into parcells, which undoubtedly must much facilitate the operation of the *natural ferment*: As we see all *menstruums* will sooner dissolve *metalls* when they are filed into parcells, than when they continue in the lump. 2. If it had not a *Tunica villosa*, the *Tunica carnoſa* would be apt to be too much distended by our meat and drink, which would necessarily weaken the tonical motion of the *stomach*, and consequently therefore its *digestion*.

Fifthly, that there be a right *digestion*, it's necessary that there be windings of the *Intestines*; for if it were not for these, the *digested meat* would move too fast from the *stomach*, and so torment us with perpetuall hunger. Which assertion I think may sufficiently be confirm'd by these two instances. The first is from *Cabrollius*, observation the 10th, and *Riolanus Anthrop.* lib. 2. cap.

*Firminus Chaudonius voracitate erat Erysichtonæa, cui causam præbuit, quod nec stomachi nec intestinorum figuram ullam habebat proportionatam, unicum à Pylori loco ad Anum Intestinum erat sine ullo anfractu, cumque aliorum Intestinæ quatuordecim & quant ulnas, hujus vix ad quatuor spithamas. accedebant in formam literæ S.* The 2. Instance is taken from a creature in *Lithuaniæ* and *Muscovy* that generally feeds upon it's prey, till it's belly be fwell'd like a bladder, then conveys it self to some strait place, and so violently forces

forces the meat out of its *stomach* and *intestines*, and then immediately returns to its prey with as craving an appetite as before: which continuall and insatiable hunger is judged to proceed from the *straitness* of its *Intestines*, for, as the Learned *Pawius* observ'd in its dissection, its guts had no circumvolutions or windings. From these therefore 'tis plain that besides a fermenting liquor in the *stomach* other externall means concurr to digestion.

I shall therefore in the last place inquire what may probab'y be the *Ingredients* of the *natural ferment*, & so conclude. The *Ingredients* of the *natural ferment* I take to be these. The *saliva*, the *succus* of the *Glands* of the *stomach*, and a *nitro-aereal spirit* of the *nerves*. That the *Saliva* is an ingredient, may seem probable from these reasons. 1. Because that by the help of this, *meats* tho impregnated with different principles, may be made to mix with a *menstruum*; for, as the Learned *Steno* has it pag. the 27th, *de glandulis oris*: *Saliva vero omnia ferre valet; sive intra corpus sive extra corpus examinaveris, nihil invenies quod illa respuet, nihil cui sine pugna non associetur.* 2. Since the *Saliva* is impregnated with a volatile salt, it is probable that that too may help digestion. The second ingredient I take to be a *liquor* that is separated by the *glands* in the bottom of the *stomach*. And this I shall evince by the Authority of the famous *Willis*, and *Sylvius De le Boe*. And first from Dr. *Willis* in his *Pharmaceutice Rationalis*, pag. 6. *Tunica hæc villosa in postica sive convexa ejus superficie, quæ tunicae nerveæ cohæret, glandulis annulatis numeroſissimis ubique confita est, quæ proculdubio vasorum in tunica nervea debiliscentium ora contegunt: ac (uti videtur) humorem illis destinatum aut ab iis depositum, immediatius excipiunt ac percolant.* *Sylvius* pag 881. gives us this account of it: *hoc chylificans fermentum in recens natorum vitulorum ventriculis reperitur crassiusculum, diciturque coagulum: sensim autem minuitur, ac in adultis, glutinis instar, offenditur liquidiſculum inter ventriculi rugas hærens.* By these there-

fore it seems probable, that the *glands* in the *tunica villosa* separate a *fermenting liquor*, and 'tis further observ'd that those creatures which have the most of these *glands*, are the most voracious. Lastly that the *nitro-aerial spirits* of the *nerves* are an ingredient of the *stomachical ferment*, seems reasonable from the Arguments of Dr. *Mayow*, pag. 55. He argues thus: *Jam vero cum spiritus animales e particulis nitro-aereis constant, haud difficile erit intellectu quomodo effectus prædicti ab iisdem in ventriculo perficiuntur. Quanquam enim spiritus Nitro-aereus acidus non est, ab eodem tamen ferrum corroditur, vitriola perficiantur, salia fixa ad fluorem perducuntur, rerumque compages tanquam ab universali mensu solvuntur.* These therefore ( Sir ) are my thoughts concerning digestion; but here is nothing in these *Cogmatically asserted*. If therefore any *Hypothesis* here may be found erroneous, upon better grounds I shall readily lay it down.

*I am, SIR,*

*Your very humble Servant,*

*C. L.*

*An*